

Collusion Detection

Las Vegas Style



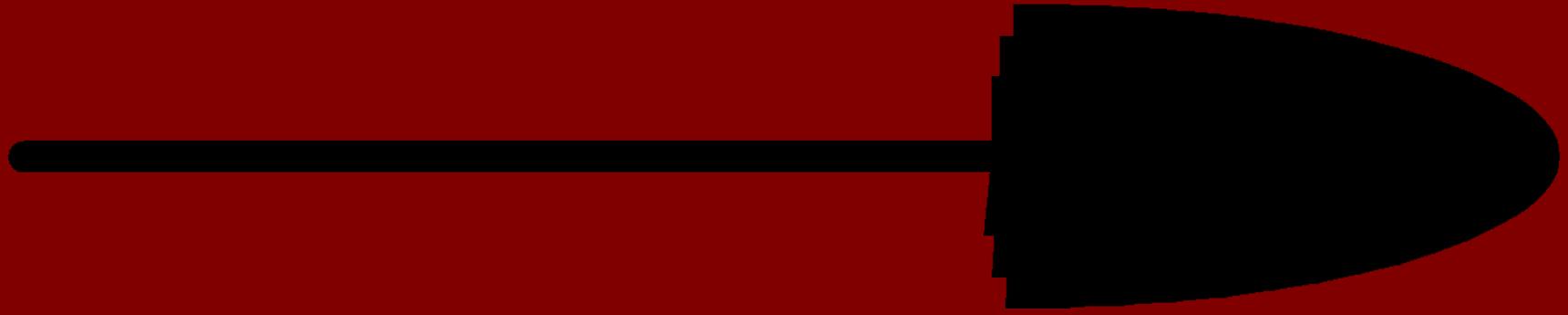
Jeff Jonas
President
Systems Research & Development
jjonas@srdnet.com

Fraud Statistics



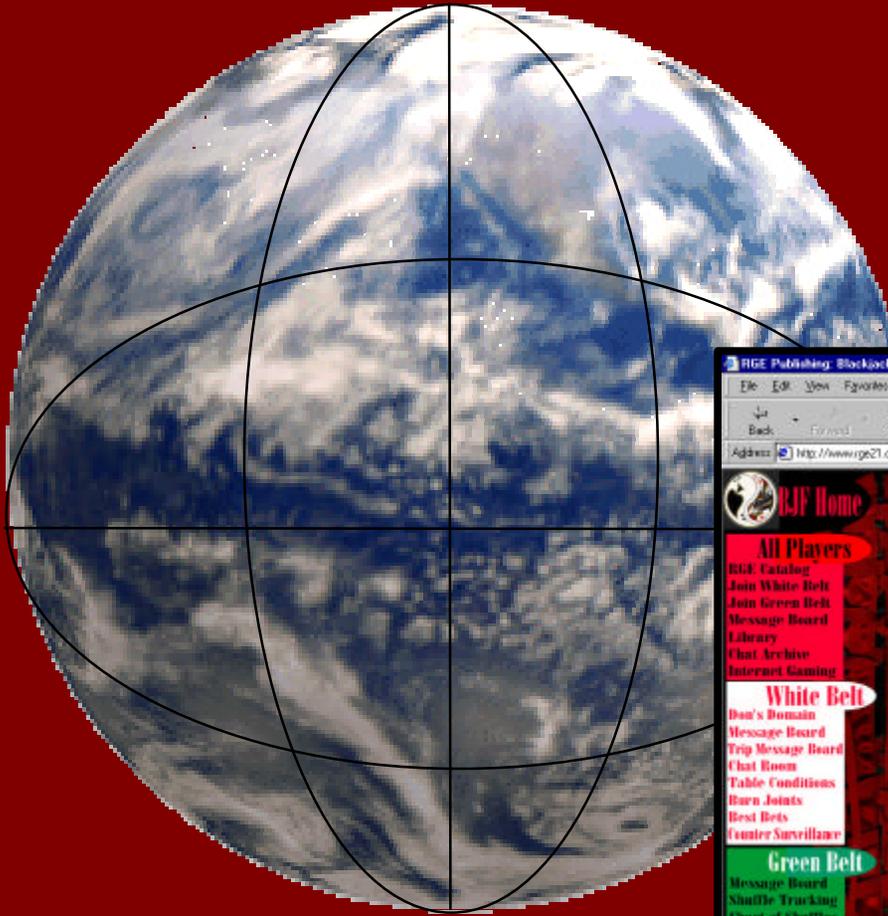
“ ... employees steal approximately \$400 billion from American businesses each year.”

U.S. Chamber of Commerce



GAMING SCAMS

Opportunists Converge!



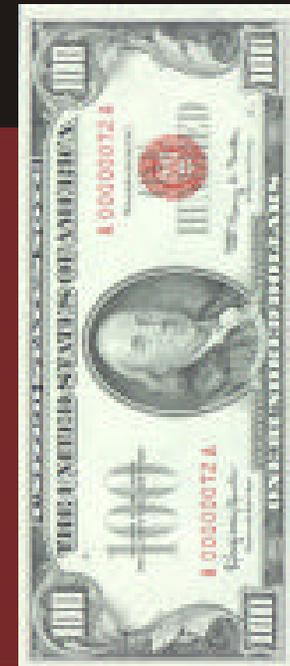
“Mini-light” Cheating Device



Bill Validator Defect



Credit
100



Roulette Past Posting



Card Counting - 101

Card Value

Count

2 - 6

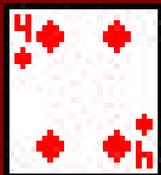
+1

7 - 9

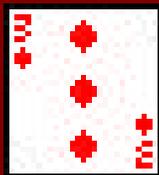
0

10, J, Q, K & Ace

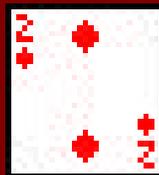
-1



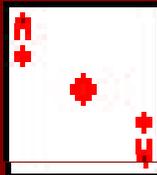
+1



+1



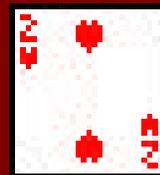
+1



-1



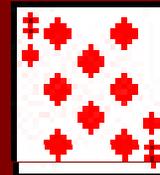
-1



+1



-1



0

Card Counting Bet Strategy

Count

-2



Count

+1



Count

+4

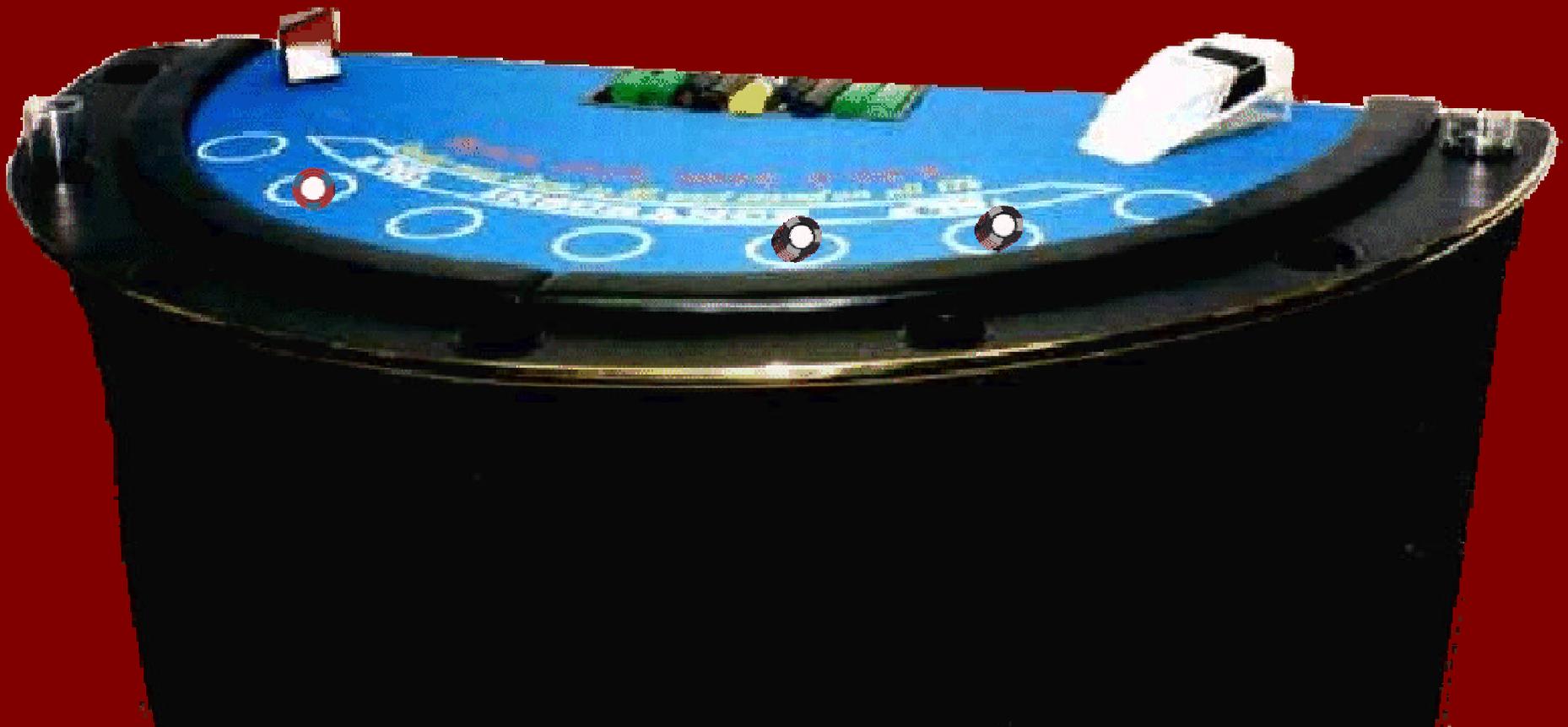


Count

+6



Count Teams



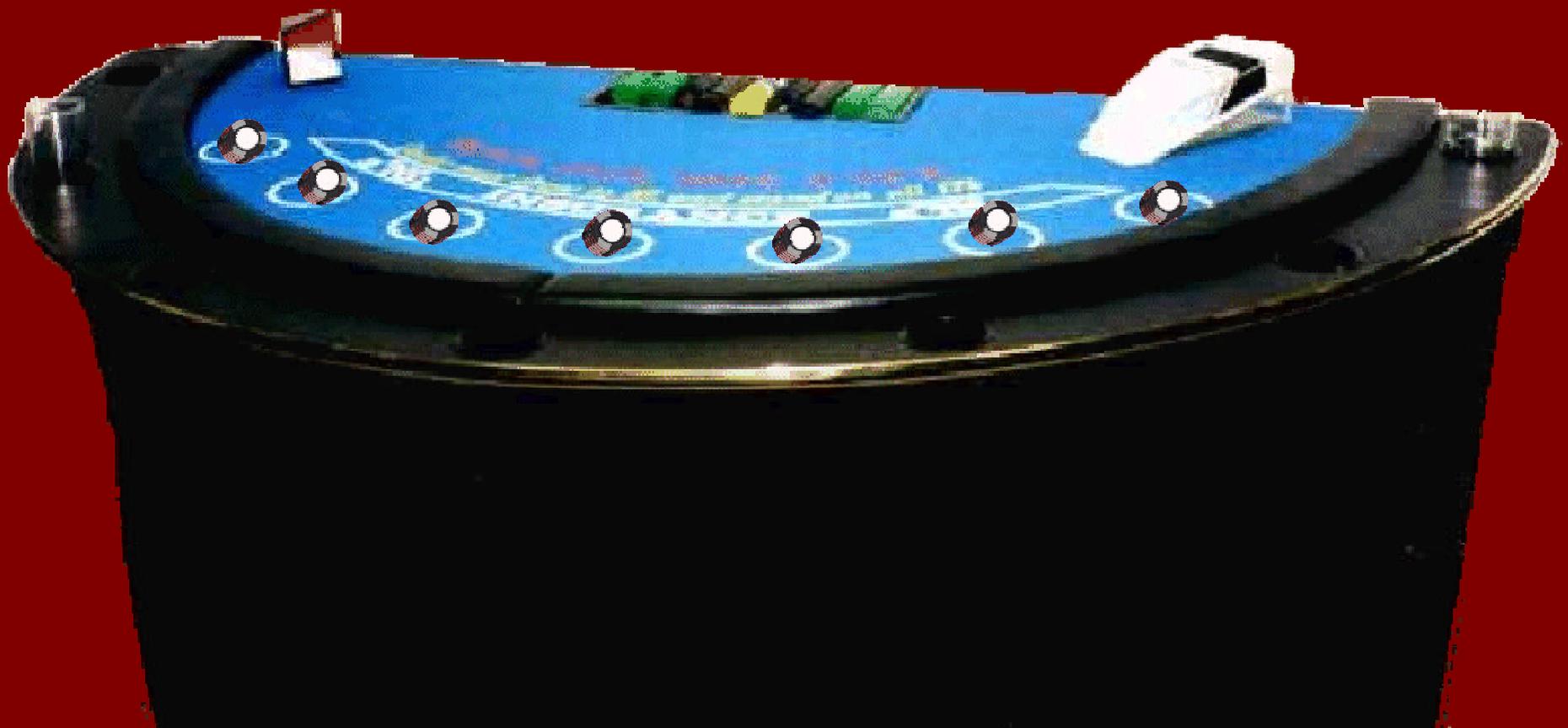
No Big Bets?



The “Chip Cup”



The "Cooler"



Camera on the Game

**Camera fits in
a coat button.**



Camera on the Game

**Button is
attached to a
man's jacket.**



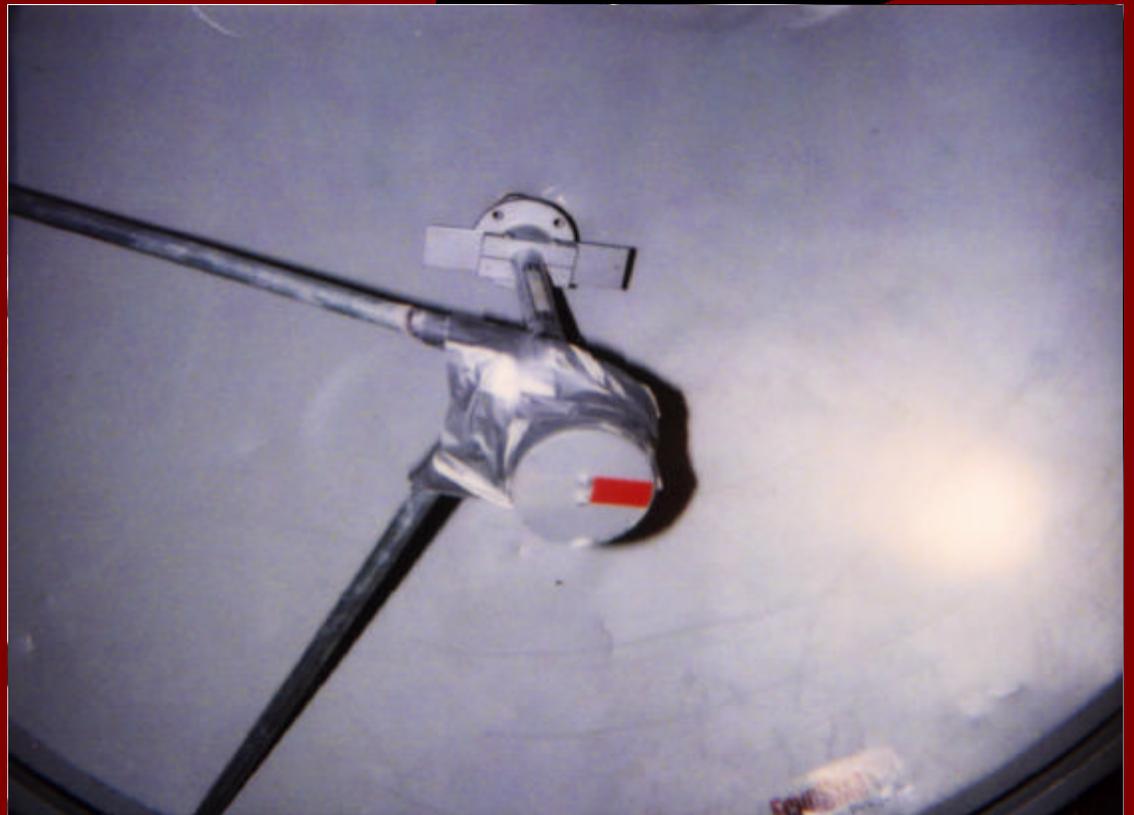
Camera on the Game

**Strapped to
the man's
body.**



Camera on the Game

**Images are
transmitted to
a vehicle in
parking lot.**



Camera on the Game

**Slow motion
video is used
to identify
card values.**



Camera on the Game

**Player is
radioed with
knowledge of
next card.**

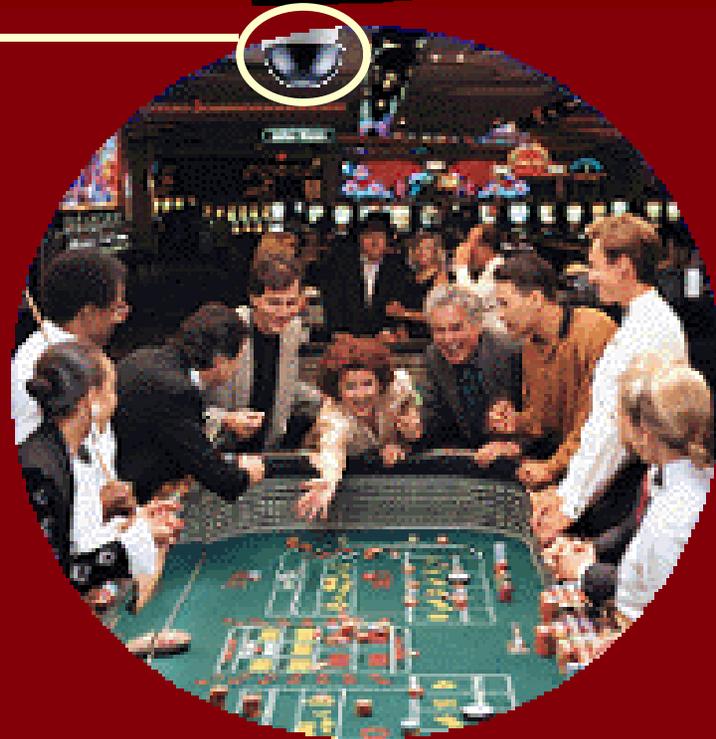




SURVEILLANCE INTELLIGENCE & FACIAL RECOGNITION

(Griffin GOLD, another strategic SRD system)

Surveillance

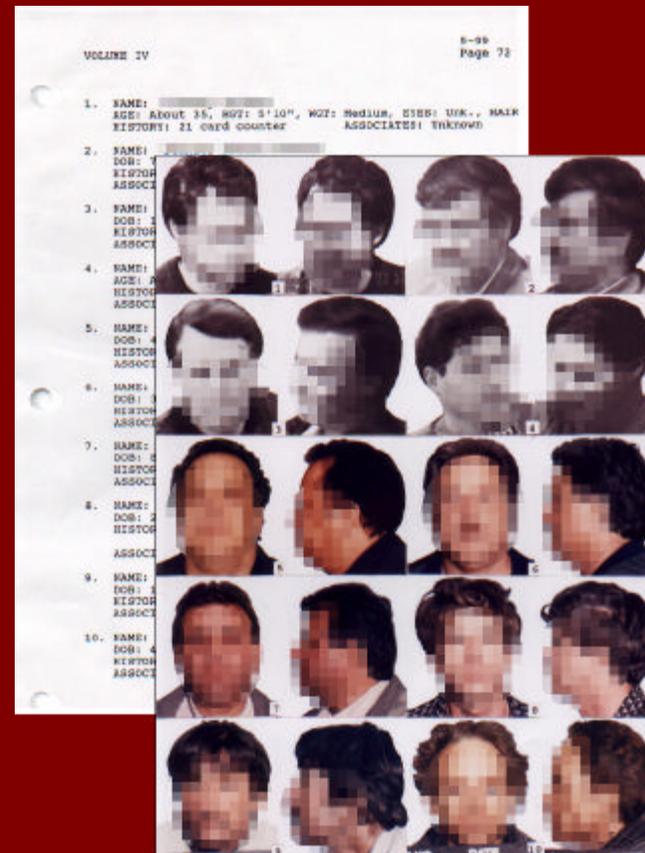


Surveillance Room



Griffin Investigations

**World-wide
tracking,
investigations,
and reporting of
counters
and cheaters.**





Griffin GOLD X

Subject Search - 1208

Subject ID

Subject

Last Name First Name DOB

Physical Description

Ethnicity Gender

Age +/- Years

Height Ft +/- Inches Hair Color

Weight +/- Pounds Eye Color

Activity Involvement

Primary Category Secondary Category

Keywords (Seperate words with spaces)

Identification

ID Type Number

Address

St Number St Name Unit

Other Addr

Country

City St Zip



Griffin GOLD

Alert

Search

Facial

Forum

Exit

Subject Browse - 1208:678

Very Active (2) Active (2) Periodic (4) Inactive (23)

Image	Main Name	Physical Description	Griffin	Private	Images
	[Redacted]	DOB: 1945-02-12 White M HGT: 5'6" ...	17	0	5
	[Redacted]	DOB: 1953-10-22 White M HGT: 5'9" ...	6	0	1

Select Back



Griffin Investigations - GOLD - Microsoft Internet Explorer

Griffin GOLD

Subject Master - 1208:679

Subject ID: 00001605

Main Name: [REDACTED]

Physical Desc: DOB: 1945-02-12 WH M HGT: 5'6" WGT: ...

Address: [REDACTED]

Identifiers: <none>

<< 5 of 5 >>

Type	Additional Name	Date	Activity	Memo
AKA	[REDACTED]	1999-10-11	Griffin Subject Upd...	
Associate	[REDACTED]	1999-10-11	Griffin Subject Upd...	
Associate	[REDACTED]	1999-09-01	Griffin ACA	SEP99-14
Associate	[REDACTED]	1999-07-08	Griffin bulletin	08JULY99
Associate	[REDACTED]	1999-07-01	Griffin ACA	JUL99-14
Associate	[REDACTED]	1999-04-01	Griffin ACA	APR99-9
Associate	[REDACTED]	1999-04-01	Griffin ACA	APR99-10
Associate	[REDACTED]	1999-02-11		

Date	Comment	User
1999-02-11	EYES: BROWN, HAIR: DARK BROWN	044
1989-09-01	ROULETTE BET CAPPER, PAST POSTER	044

Add Report Back

Exit

http://enterprise/griffin/products.html Local intranet

Griffin GOLD



Alerts

Search

Docs

Facial

Facial Search - 3330:0



with Visionics' FaceIt® technology

Search Criteria

Gender Male

Ethnicity <none>

Primary Category <none>

Years to Search 2

Search

Exit

Alerts

Search

Docs

Facial

Facial Search



Subject Browse - 3330:378

Top (28)

Image	Rank	Main Name	Physical Description	Griffin	Private	Images
	7.74			13	0	3
	7.62			13	0	5
	7.51			2	0	1
	7.41			12	0	4
	7.39			5	0	7
	7.31			7	0	6
	7.25			10	0	3
	7.24			36	0	6
	7.23			7	0	3
	7.21			1	0	1

Select

Back

Exit

Alerts

Search

Docs

Facial

Facial Search



Exit

Subject Master - 3330:378

Subject ID 00000899

Main Name

Physical Desc DOB: 21 Jul 1956 WH M HGT: 6' WGT: 220

Address

Identifiers <none>



<<

6 of 6

>>

Type	Additional Name	Date	Activity	Memo
AKA		17 Feb 2000	Griffin Subject Upd...	
AKA		17 Feb 2000	Griffin Subject Upd...	
AKA		1 Jan 2000	Griffin ACA	JAN00-1
AKA		1 Nov 1999	Griffin ACA	NOV99-1
AKA		1 Oct 1999	Griffin ACA	OCT99-1
AKA		1 Sep 1999	Griffin ACA	SEP99-2
AKA		1 Jun 1999	Griffin ACA	JUN99-1
AKA		1 May 1999	Griffin ACA	MAY99-1

Date	Comment	User
1 Aug 1996	EYES:BROWN, HAIR:BROWN	044
8 Jan 1999	LEADER OF GROUP OF 21 COUNTERS AND SHUFFLE TRACKERS	107

Add Report

Back

Global Activity Monitoring (Griffin 2000)



Puerto Rico

Game Integrity Protection



- Hiring standards
- Policies and procedures
- Training
- Surveillance/Security
- Shared intelligence
- Internal audits
- Background check updates



COLLUSION DETECTION

“Collusion”



“A secret agreement for fraudulent or illegal purpose; conspiracy.”

Webster’s New World College Dictionary

Consolidated Database

Applicants

Employees

Vendors

Customers

Prospects

Griffin Subjects

Incidents

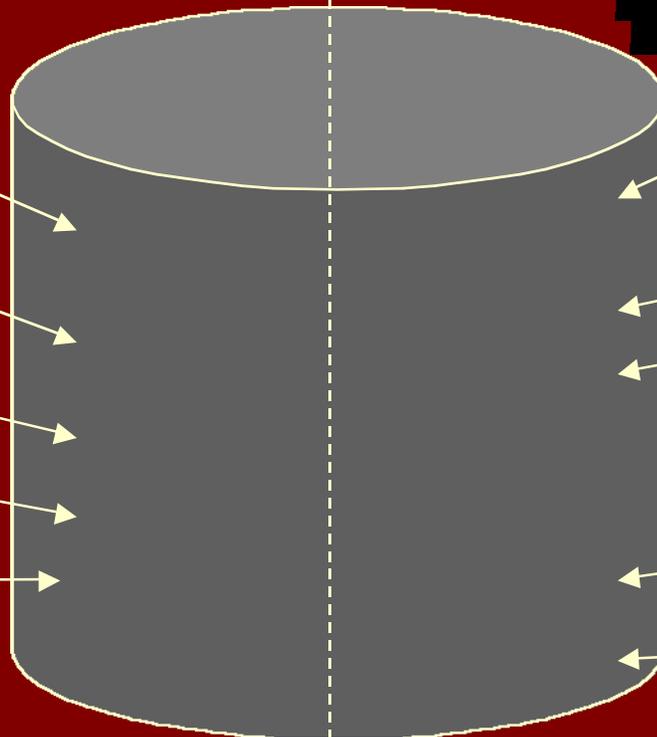
**Organized Crime
Digest**

Black Book

Intelligence

Desired Entities

Undesired Entities



Entity Relationships

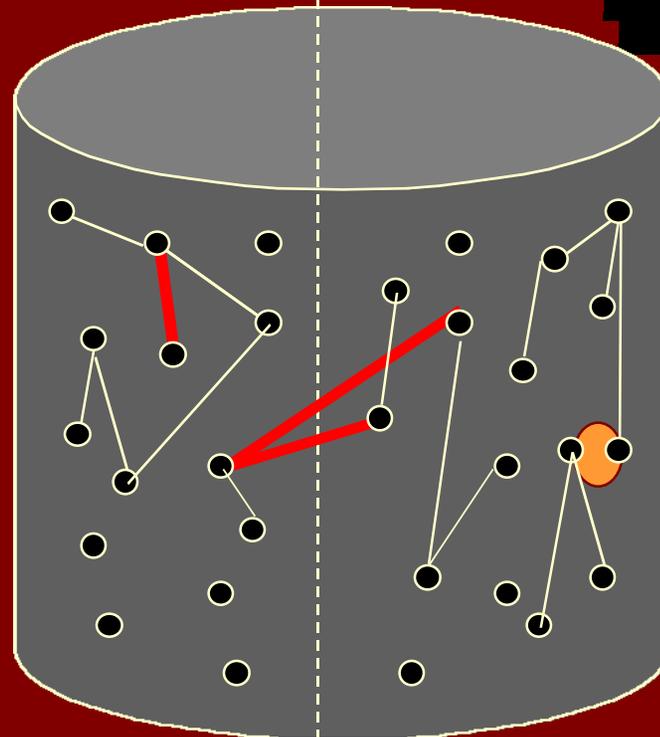
Applicants

Employees

Vendors

Customers

Prospects



Known Cheaters

Incidents

Organized Crime

Digest

Black Book

Intelligence

Desired Entities

Undesired Entities

Rule-Based Alert Reporting

**ALERT
RULE #1**

**Employee
relationships
to undesirable
entities**



Collusion?

Marc Nelson (Arrested cheater)
Sue Brinkley (Roulette dealer)

*Share same phone
number!*

Rule-Based Alert Reporting

ALERT RULE #2

**Employee
relationships
between cash
handlers
and security**



Collusion?

Brenda Delayne (Surveillance)
Kevin Oswald (Softcount)

*Shared residence
June 92 - May 95!*

Rule-Based Alert Reporting

ALERT RULE #3

**Different
employees
determined as
the same**



Fraud?

Jose Galvin Jr. (Cook)
Victor J. Galvin (Dishwasher)
V. J. Galvinger (Food Server)

*Share same tax ID,
address, and phone!*

Rule-Based Alert Reporting

ALERT RULE #4

Vendor
relationships
to supervisor
or higher level
employee



Collusion?

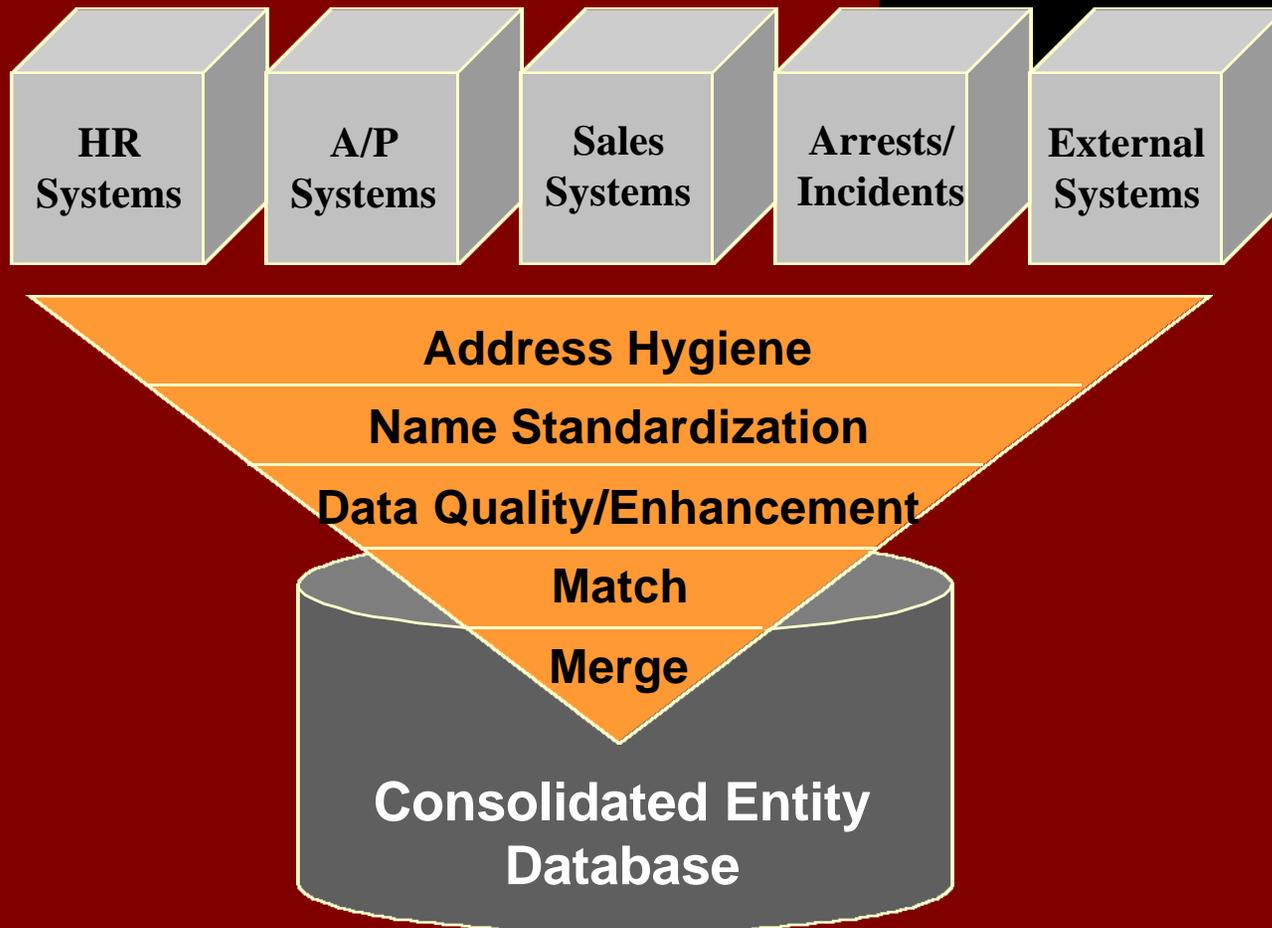
Kirk Preston (A/P Manager)
Acme Paper (\$1.2M Contract)

*Acme contact was a
reference on Kirk's
application!*



METHODOLOGY

Collusion Analysis Processing



*Address Hygiene Node
Address Standardization*



**460 Oak Street
Mill Valley, Ca 94914**



**460 South Oak Ave
Mill Valley, Ca 94941**

**4737 Simeron Drive
Easton, Ma 02334**



**4737 Cimarron Drive
Easton, Ma 02334**

Data Quality Node Name Standardization

**Dick, Dickie, Ricardo,
Rich, Richie, Rick,
Rickey, Ricki, Rickie,
Ricky, Rikki, Ritchie**

Richard

**Ruhullah, Ruh-ul-
Amin, Ruh-ul-Haqq,
Ruhul Qudus**

Ruh

Data Quality Node Formatting Standards



(602) 731-1370 → **(602) 731-1370**

7074121234 → **(707) 412-1234**

557-672061 → **557-67-2061**

897656 → **000897656**

Data Quality Node Parsing Standards

Alexander, Mark A. Jr. PHD

Last Name = Alexander

First Name = Mark

Middle Name = A

Generation = Jr

Suffix = PHD

Data Quality Node

Quality Standards

Phone Numbers

(213) 543-	→	Rejected (Length)
(800) 555-1212	→	Rejected (Generic)
(000) 000-0000	→	Rejected (Invalid)

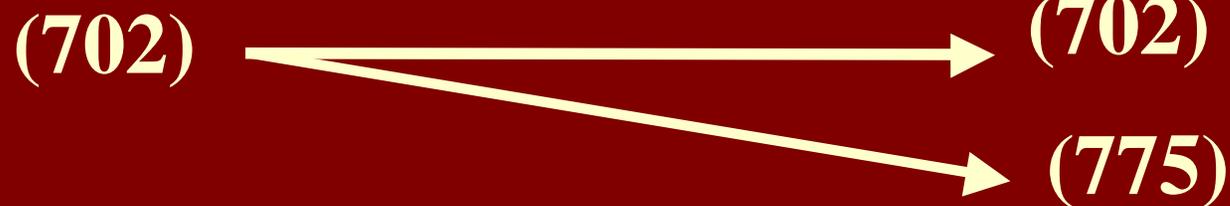
Last Names

^%@\$	→	Rejected (Symbols)
U	→	Reject?

Data Quality Node

Area Code Splits

Area Code Split

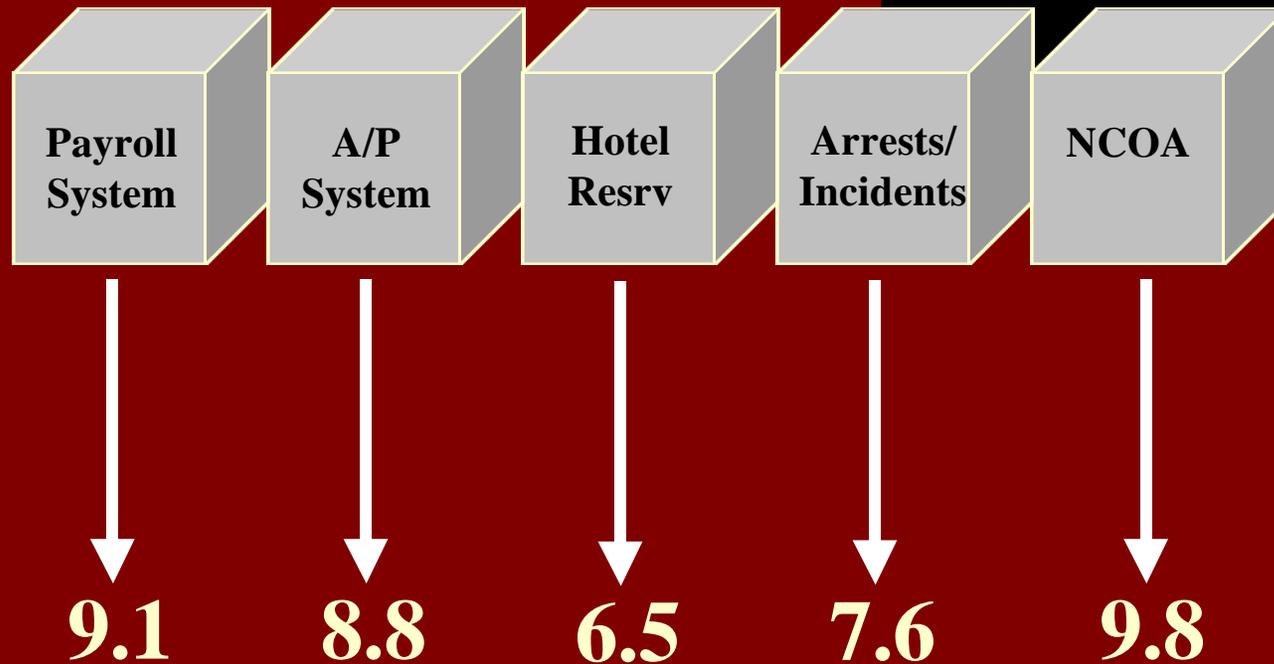


Area Code Correction



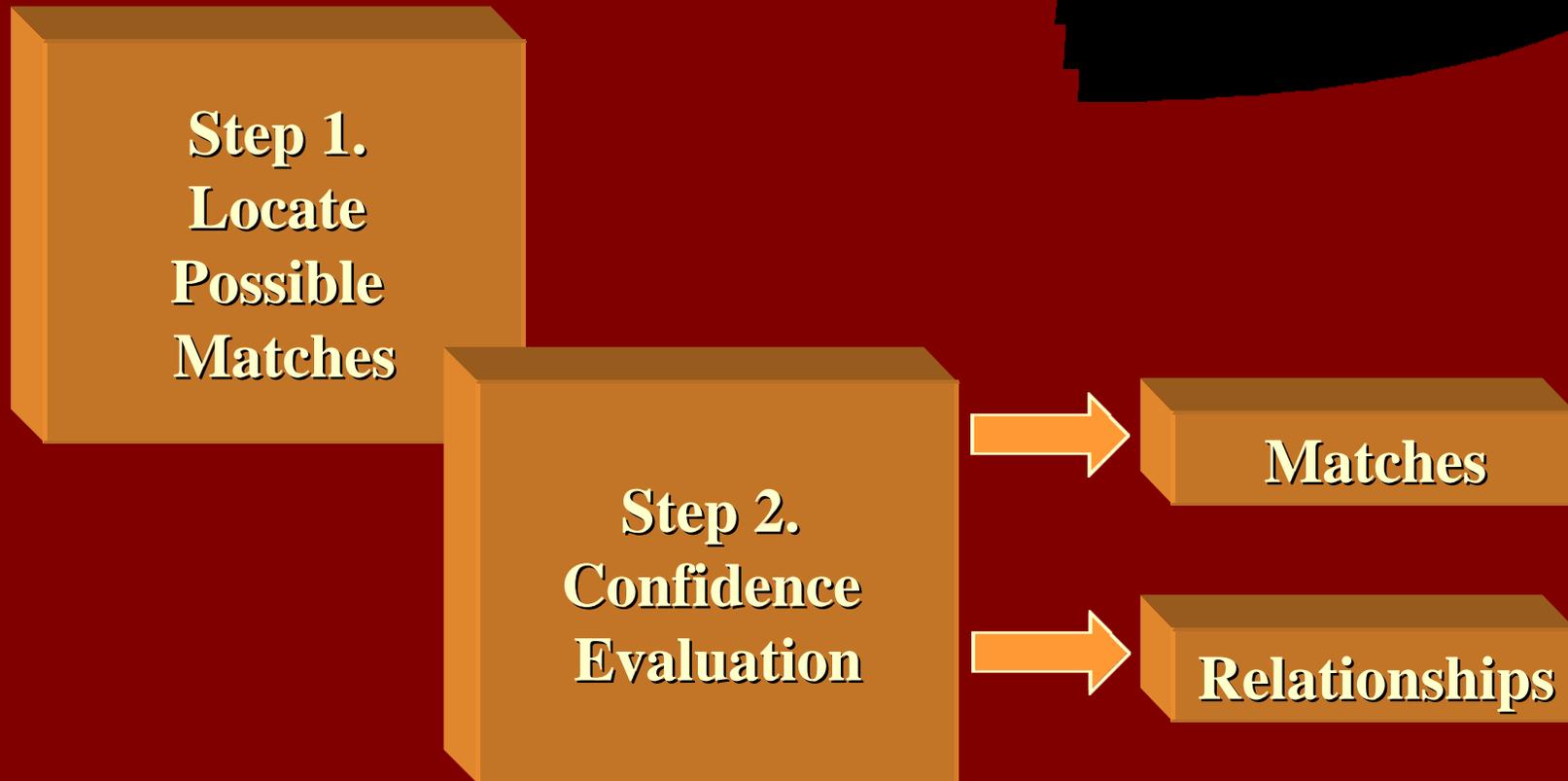
Data Quality Node

Data Source Confidence



Confidence Scale 1-10

Match/Merge Node Relationship Testing



Match/Merge Node Confidence Evaluation

Robert I. Ashley Jr.

1024 Mexcal

Las Vegas, Nv. 89110

132-42-1776

(702) 401-0008

“Known Felon”

Bob Ashley

1024 Mescal Way

Las Vegas, Nv. 89110

133-42-1776

(707) 459-5678

“Employee Address Change”

Database Architecture

Entity ID# 00034256



Names

Sue Loudin
Susan Fra
Sue Mille

Addresses

460 S. Oa
4737 Cim
POB 1745
1101 Prin

Numbers

(702) 555-2091
(916) 342-6721
012-34-5678
5021 1111 2391 1231

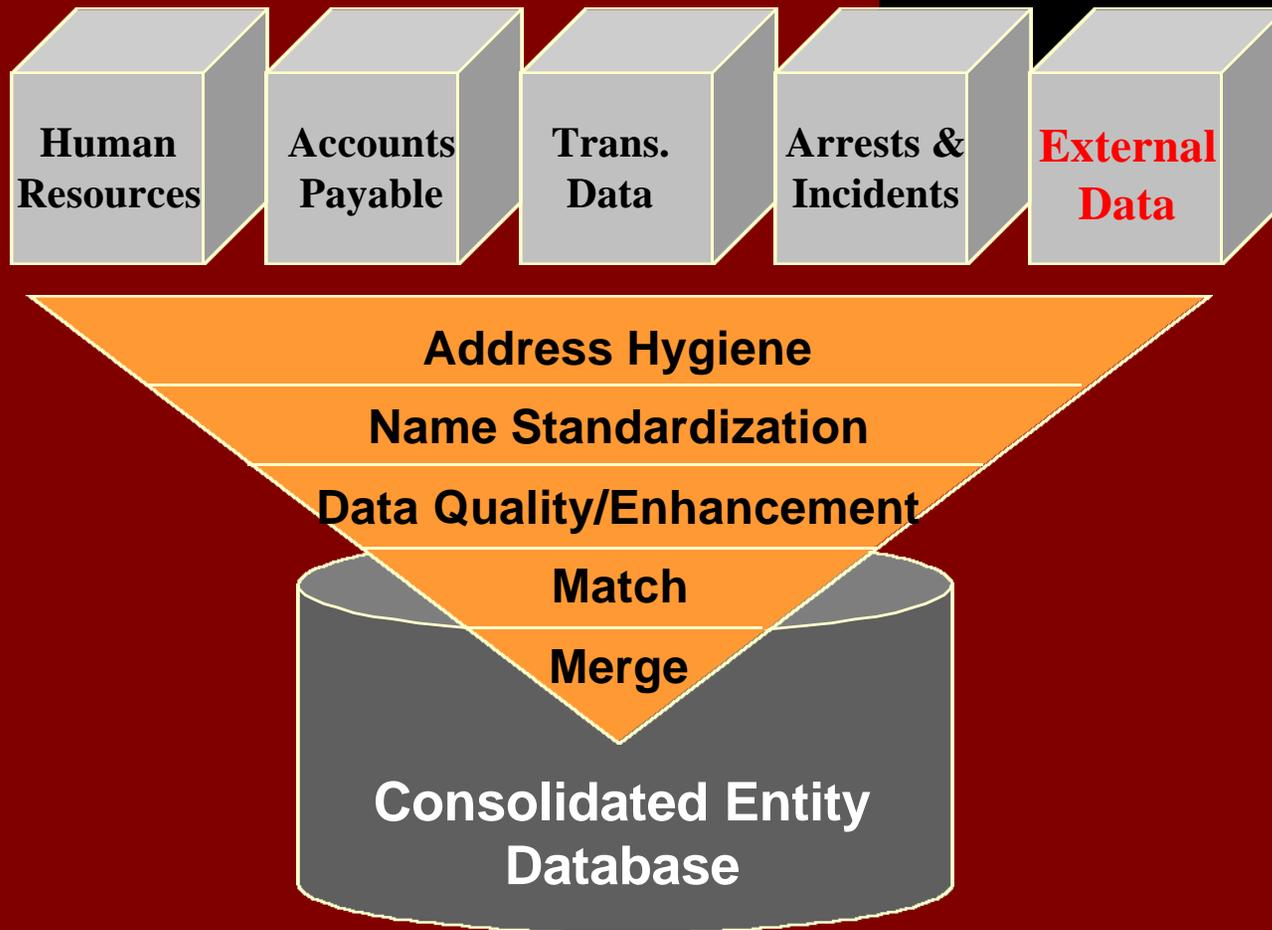
Relations

Spouse: John Loudin
Ref : Mary Miller
Ref: Jason Miller
Ref: Kelly Jones



EXTERNAL DATA ENHANCEMENT

External Data Enhancement



External Data Enhancement



- **Last 10 years of addresses**
- **Address latitude/longitude**
- **Aliases**
- **Phone number**
- **Date of birth**
- **Social Security Number**
- **Property ownership**
- **Bankruptcies**
- **Lifestyle indicators (Income, purchasing power, etc.)**



RESULTS ...

Alert

Reporting

SUMMARY OF FINDINGS ...

SOURCE DATA OF FINDINGS ...

RECOMMENDED ACTION ...

Inform
Kelly
paya
relati
agen

Kelly
Decen
positio
Manag
record
contac
(702) c
busine
Chem

Based on the above information indicating a possible relationship between Smith and ACME Chemical it is recommended that an appropriate investigation should be conducted determining the principals in ACME Chemical and relationships, if any, between the principals and Smith.

Kelly
Emerg
(702) c
ACMI
(702) c

D
V
M
F

Collusion Testing at a Large US Retailer



- **Extent of Analysis**

- 800,000+ employees *including* emergency contact information
- Vendors *including* up to 8 alternate addresses
- Arrests

- **Findings**

- 564 Employee who have vendor or criminal relationships
- 26 Employees who are vendors

Collusion Testing at a Major Strip Casino



- **Extent of Analysis**
 - 20,000+ employees (current and terminated)
 - All vendors
 - All slot club and table games rated players
 - In-house arrests/incidents database
 - Griffin database
- **Findings**
 - 24 active players were known Griffin subjects
 - 23 players had relationships to prior arrests/incidents
 - 12 employees were themselves the player
 - 192 employees had possible vendor relationships
 - 7 employees were the vendor

Federal Agency Findings

(during a 3 day pilot)

- **Extent of Analysis**
 - 20,000+ employees (current & Northeast only)
 - 75,000+ vendors
 - 400,000+ security risk entities
- **Findings**
 - 140 employee relationships to vendors
 - 1451 vendor relationships to security risks
 - 253 employee relationships to security risks entities
 - 2 vendors were the security concern
 - “n” employees were the security risk/vendor

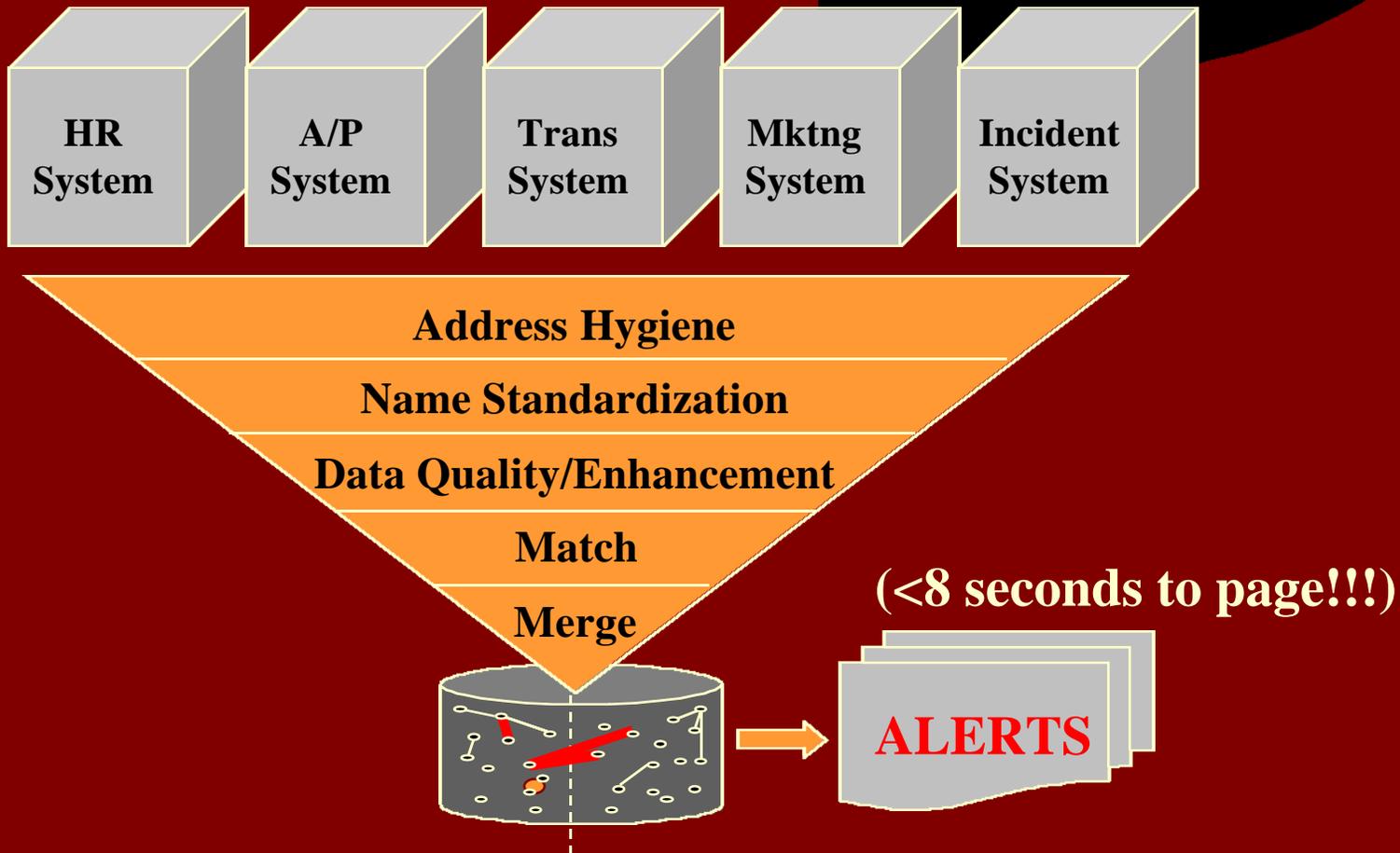


TOO LATE!

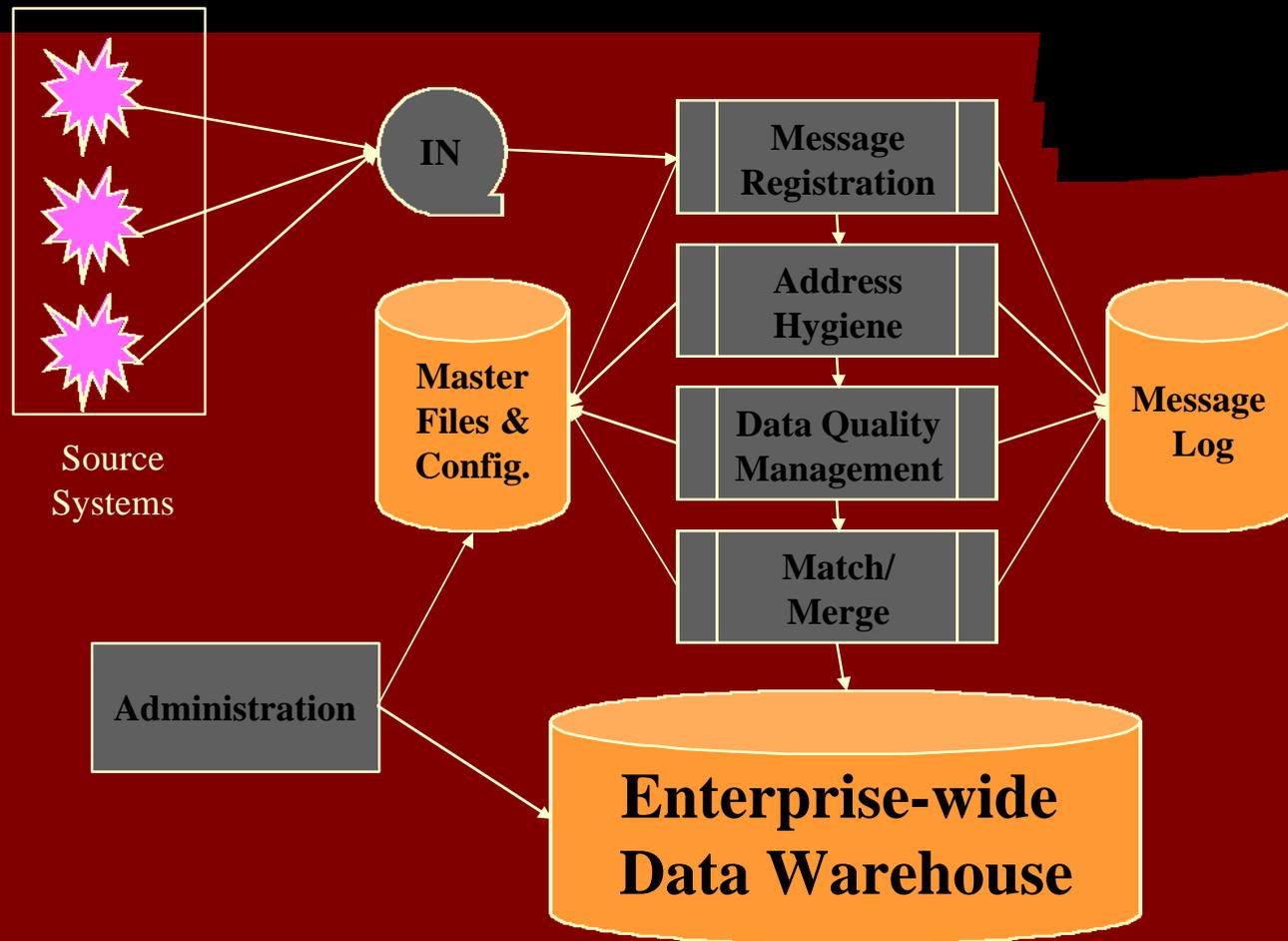


**NEAR REAL-TIME DATA
WAREHOUSING & ALERT
ESCALATION**

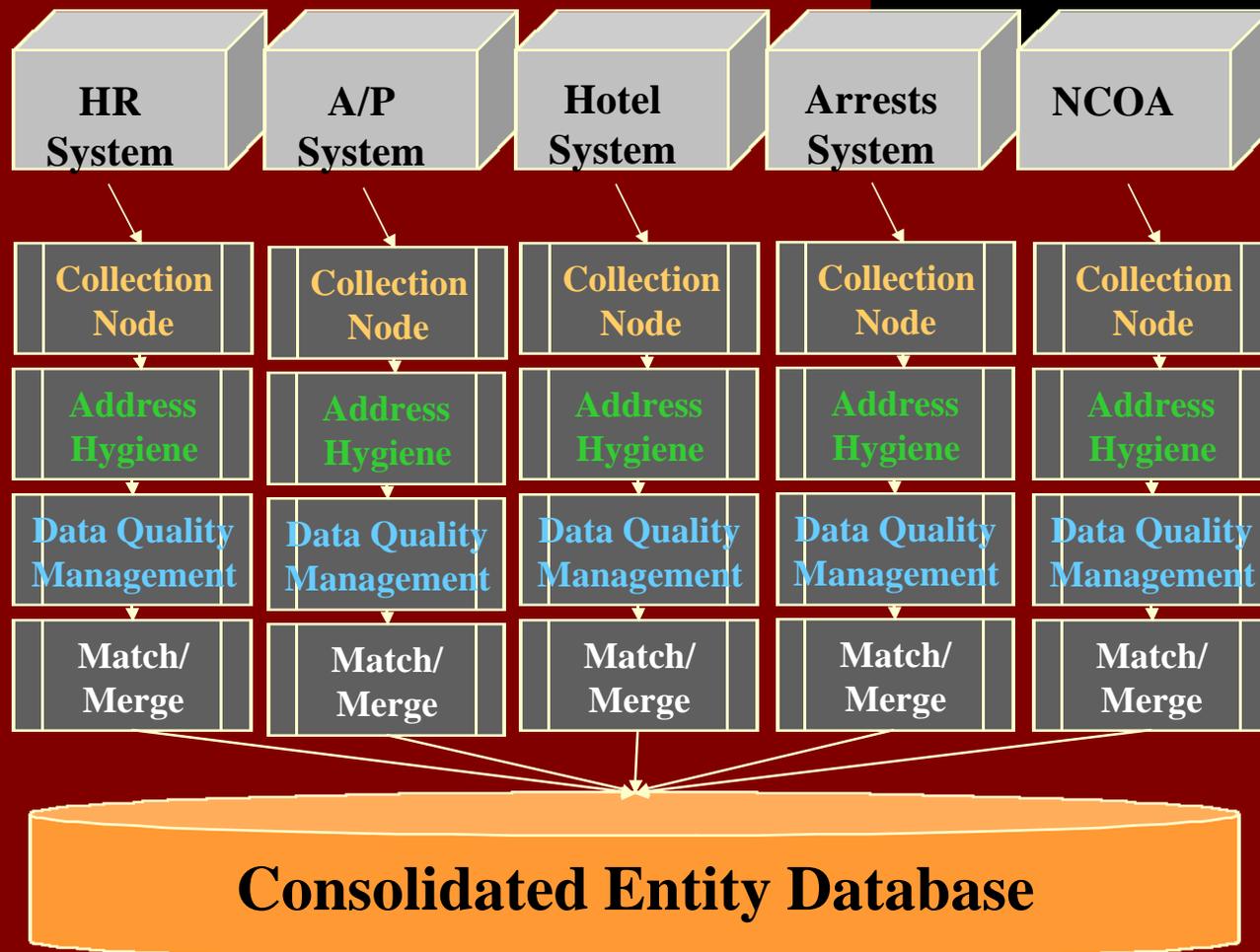
Near Real-Time Analysis



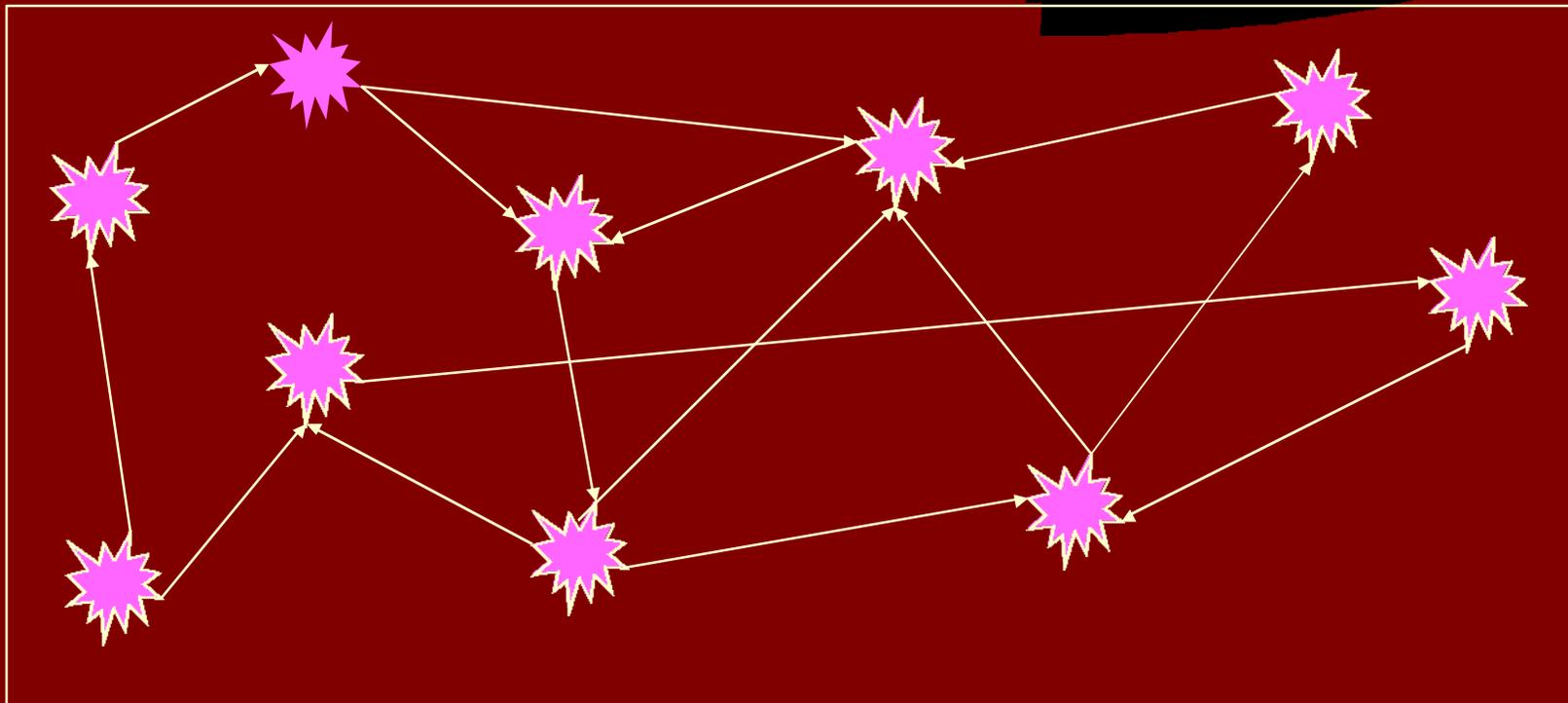
Data Warehousing Style Architecture



Data Warehousing Style Architecture

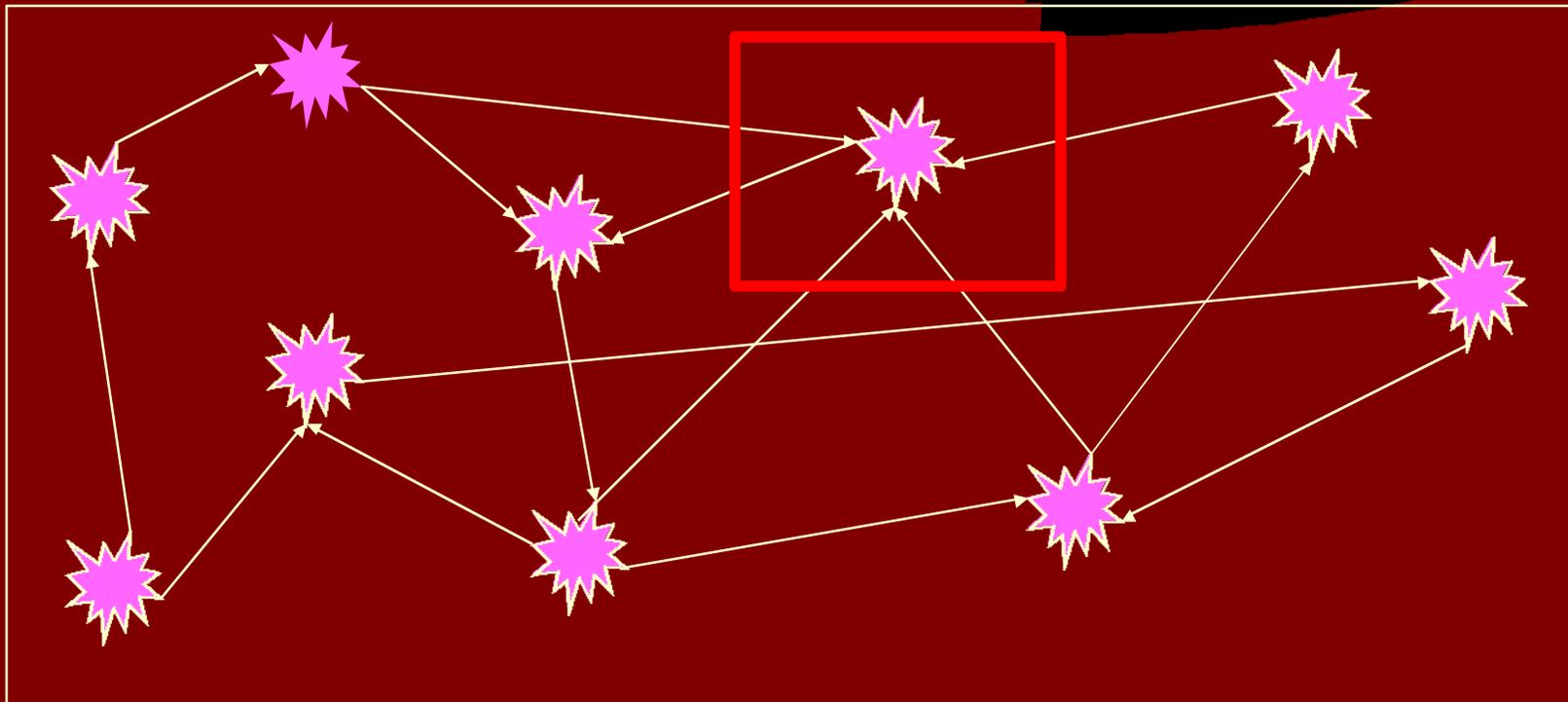


System Integration



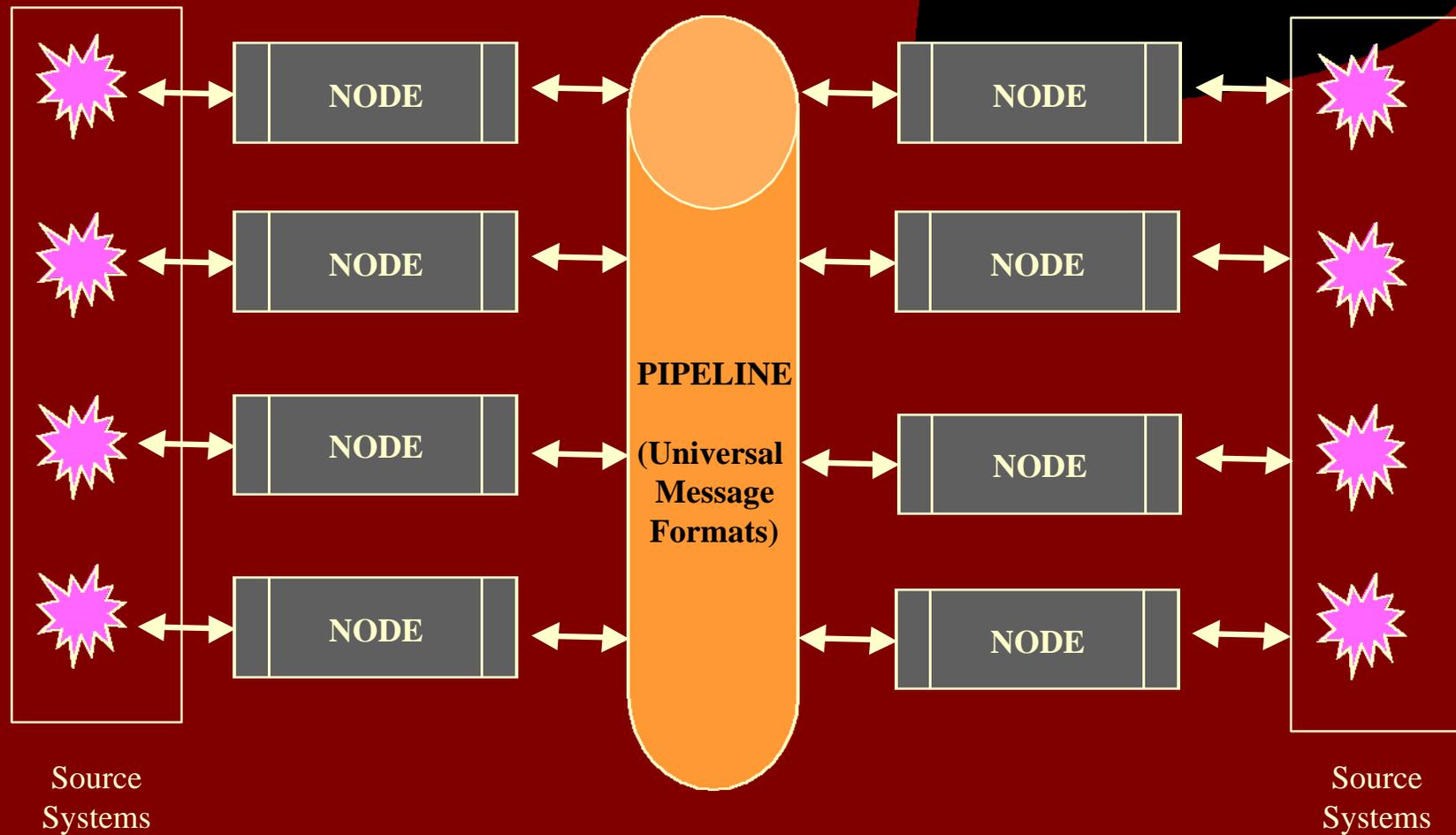
Source Systems

Serious Dependencies

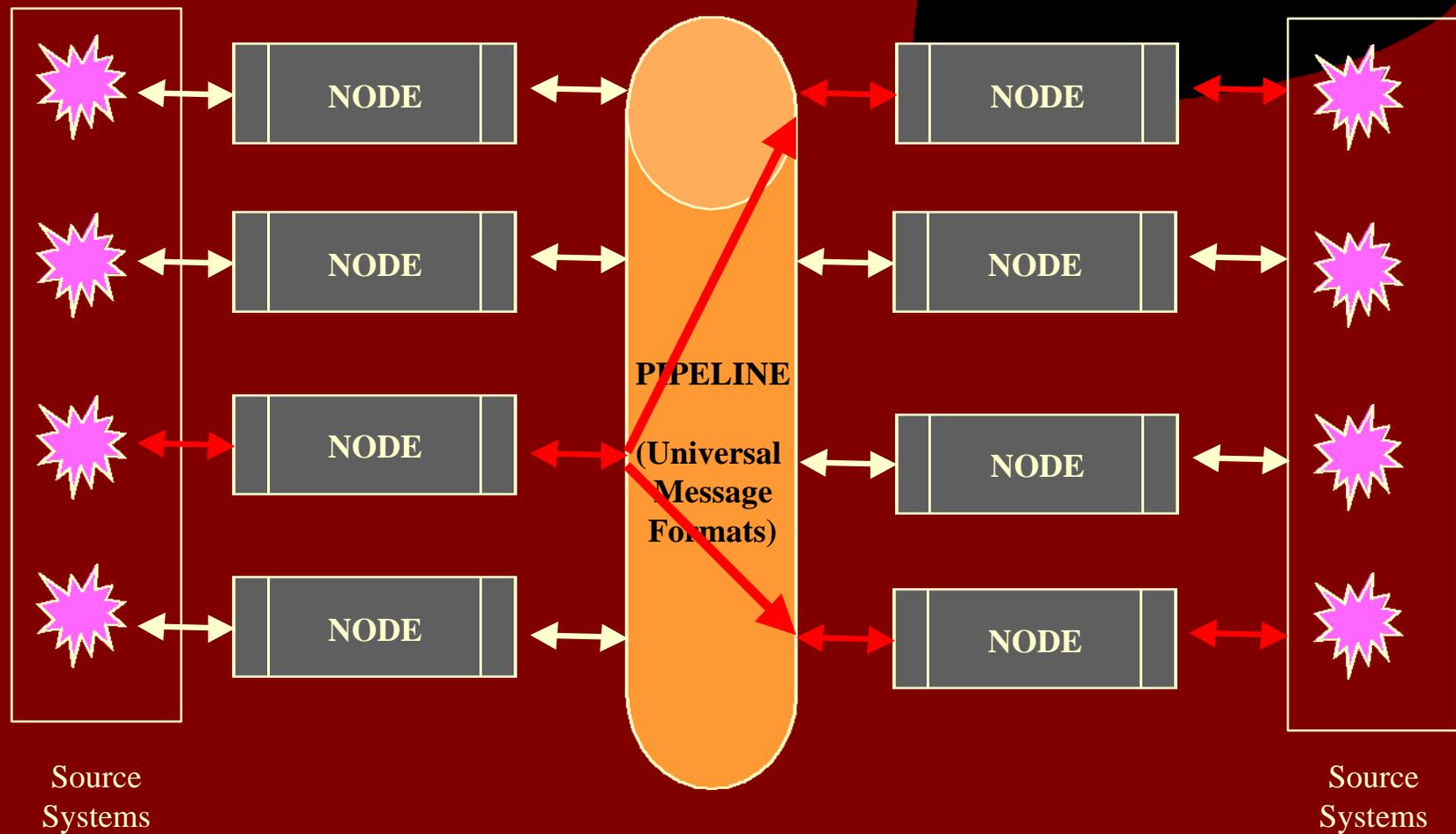


Source Systems

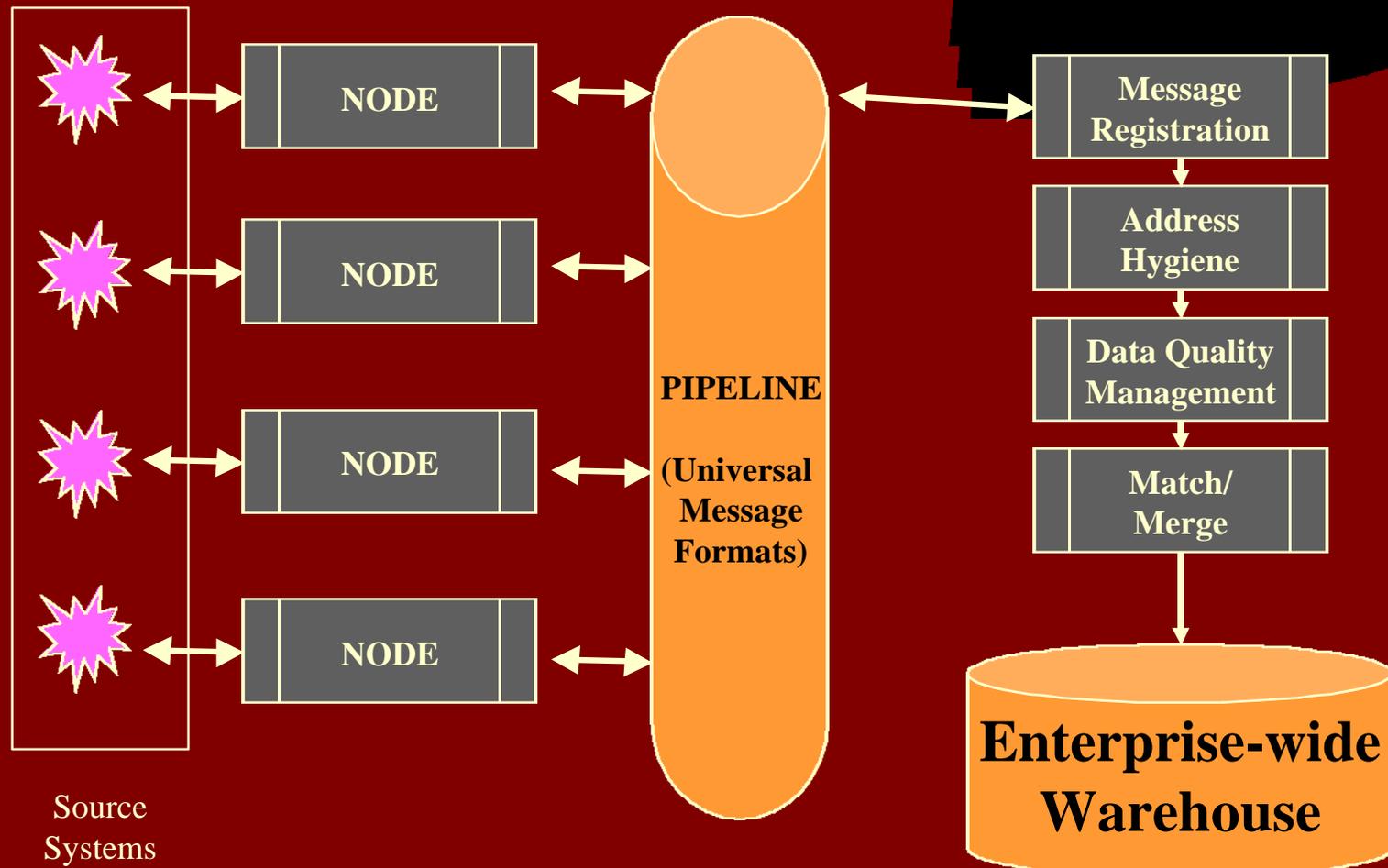
Central Messaging Engine (CME)



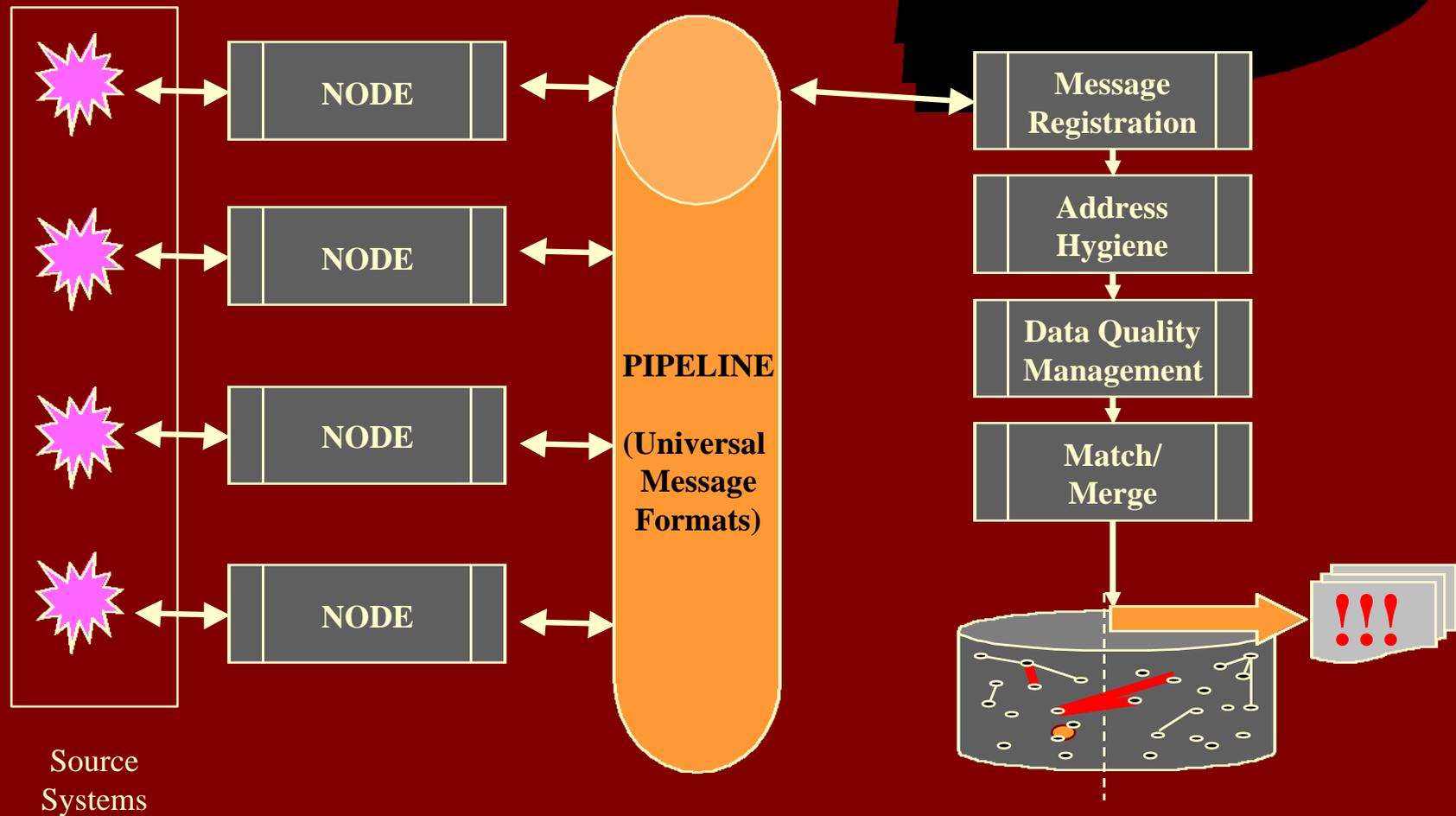
CME Routing Rules



Near Real-time Warehouse



Near Real-time Alert Escalation





FINAL THOUGHTS

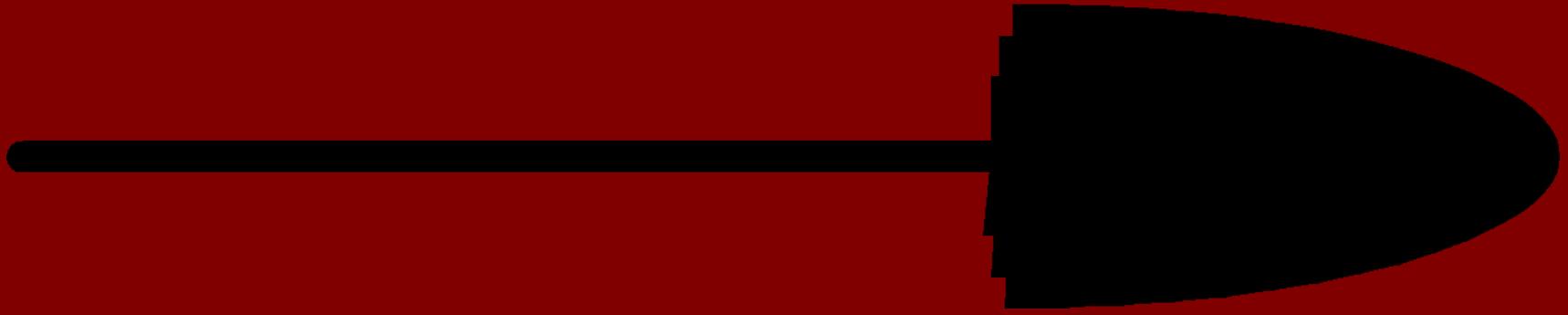
Special Considerations



- Size of data set changes tuning
 - Match/merge rules
 - Proximity derived relations (latitude/longitude)
- Adjust alert rules for creating of actionable output

Critical Success Factors

- Always load the good guys and the bad guys
- Need rich data sets
 - e.g. Emergency contacts, employment references
- Need volumes of data
 - Small entity data sets have limited returns
- Use data enhancement techniques for military grade results
 - e.g. address histories, latitude/longitude, bankruptcies, lifestyle indicators, etc.



what might you find?



QUESTIONS?

Collusion Detection

Las Vegas Style



Jeff Jonas
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